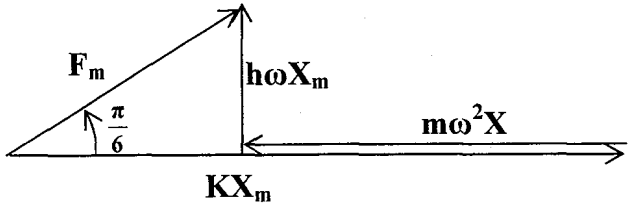
b- $\omega = 8rad.s^{-1} < \omega_0 = \sqrt{\frac{k}{n}} = 10rad.s^{-1} \Rightarrow m\omega^2 < k$

* $kX_m = 1,6N \rightarrow 8cm$

$0,2N \rightarrow 1cm$

* $m\omega^2 X_m = 0,2(8)^2.80^{-2} = 1N \rightarrow 5cm$

* $\varphi_F - \varphi_x = \frac{\pi}{6}$



c-D'après la construction

$F_m \rightarrow 3,5cm$
$0,2N \rightarrow 1cm$ $\Rightarrow F_m = 0,7N$

$h\omega X_n \rightarrow 2cm \rightarrow hwX_n = 0,4N$

$h = \frac{0,4}{8.810^{-2}} = 0,625kg.s^{-1}$

4°)

a- $I_m = \frac{U_n}{\sqrt{R^2 + \left(L\omega - \frac{1}{C\omega}\right)^2}}$

$V_m = \frac{F_m}{\sqrt{h^2 + \left(m\omega - \frac{k}{\omega}\right)^2}}$

b-Résonance de vitesse

$\omega_1 = \omega_0 = \sqrt{\frac{k}{m}} = 10rad.s^{-1}$

c- $f(t) = -hv(t) = -hV_n \sin(\omega_0 t + \varphi_v) = -F(t)$

$\omega = \omega_0 \qquad F_m = hV_m = 0,5N$

$\varphi_F = \varphi_V = 0$

Donc $f(t) = -0,5\sin(10t)$ en N $f(t) = -F(t)$

d- $E = Ec + Ep = \frac{1}{2}mv^2 + \frac{1}{2}kx^2$

$\frac{dE}{dt} = mva + kxv = v(ma + kx) = v(F - fhv)$

$= v(F + f) = 0 \quad \Rightarrow$ E = constante

$E = \frac{1}{2}mV_n^2 = \frac{1}{2}.0,2\left(\frac{0,7}{0,625}\right)^2 = 0,112J$

$V_m = \frac{F_m}{h}$